

ANGELLY CABRERA

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EDUCATION

University of Southern California, Los Angeles, CA
B.S. Electrical and Computer Engineering

May 2024

RESEARCH EXPERIENCE

Sarcasm-Enhanced Hate Speech Detection

April 2024 - Present

Advisor: Dr. Antonio Ortega, USC

- Proposed and developed a BERT-BiLSTM model to detect implicit hate speech in sarcastic or coded language often missed by current state-of-the-art systems.
- Employed sarcasm pretraining and sequential transfer learning to improve model performance, achieving 71% precision and 88% recall.
- Established sarcasm pretraining as a performance-enhancing strategy, improving hate speech detection by 7% across all metrics, including precision, recall, F1-score, and AUC.

Monitoring Productivity in the Workplace

January 2024 – March 2024

Advisor: Dr. Shrikanth Narayanan, USC

- Performed statistical tests on physiological and survey data to analyze feature variability in stress, mood, and productivity across work environments.
- Built and optimized a random forest classifier for self-reported attributes using mean imputation, z-score normalization, and hyperparameter tuning with cross-validation.

Leaf Rust Detection on Low-Resolution Images

August 2023 – July 2023

Advisor: Dr. Shrikanth Narayanan, USC (Awarded Honorable Mention)

- Investigated performance limitations of disease detection models on low-resolution imagery common in field applications, focusing specifically on coffee leaf rust.
- Enhanced lesion contrast through high-pass filtering to improve model learnability.
- Designed and trained CNNs for early coffee rust detection, achieving 94% precision and recall.

Wearable Bio-Sensing for Family Well-Being

January 2022 - December 2023

Advisor: Dr. Shrikanth Narayanan, USC

- Engineered preprocessing scripts to convert biometric data from wearable devices into datasets with daily metrics, such as sleep analysis, for each participant across 14 families.
- Applied audio transformers to extract event tags (e.g., yelling, crying) from recordings, creating detailed histograms of speech patterns to help identify inter-family dynamics.

Understanding the Role of Machine Learning in Music

January 2021 - May 2021

Advisor: Dr. Shrikanth Narayanan, USC

- Analyzed music API datasets to identify over 100 key features, developing music genre recommendations that cater to diverse listener preferences.
- Presented findings at the fellowship's final symposium, contributing to the community's understanding of AI's potential in media and entertainment.

PROFESSIONAL EXPERIENCE

Microsoft & Cyborg Mobile

May 2024 – August 2024

Software Engineering Intern, IC3 (M365 Substrate)

- Developed a C# console application to host and migrate Microsoft Teams performance testing services from Azure Classic Cloud to Kubernetes following its deprecation.
- Containerized testing services with Docker, deployed to Kubernetes using YAML, and automated XML-based performance tests via Azure Pipelines.

Microsoft & Cyborg Mobile

May 2023 – August 2023

Software Engineering Intern, E+D (M365 Substrate)

- Developed a data extraction, analysis, and storage pipeline using LLMs, KQL, and cloud databases to summarize incident reports, identify patterns, and generate visuals.
- Applied language transformers to match predicted patterns, achieving 90% accuracy in predictions and 73% precision in similarity matching.

University of California, Los Angeles

June 2022 – April 2023

Break Through Tech AI Fellow. Verizon Team (Awarded Finalist Title)

- Compiled a dataset and trained an object detection model to classify smartphones by brand and color for inventory tracking, achieving 96% confidence and 98% precision.
- Collaborated with Verizon data scientists to design a color-sorting method using bounding boxes, RGB histograms, and Euclidean distance to distinguish 800+ color variations.

Microsoft & Cyborg Mobile

June 2022 – August 2022

New Technologist Intern

- Developed a real-time climate and emergency resource web app using React JS, integrating weather and air quality APIs to generate forecasts and provide health-based alerts.
- Built an MVP allowing users to register health conditions and receive warnings for unsafe air quality or extreme weather, using map APIs to direct them to nearby safety shelters.

PUBLICATIONS & PRESENTATIONS

- **A. Cabrera**, L. Lei, & A. Ortega, “Transfer Learning for Sarcasm-Enhanced Hate Speech Detection,” Manuscript in preparation. Planned submission to arXiv in May 2025.
- **A. Cabrera**, K. Avramidis, & S. Narayanan, “Early Detection of Coffee Leaf Rust Through Convolutional Neural Networks Trained on Low-Resolution Images,” [Published on arXiv]
- K. Avramidis, T. Feng*, M. Parga*, A. Kommineni*, **A. Cabrera***, G.M. Lucas, B. Becerik-Gerber, S.C. Roll, & S. Narayanan, “Unveiling Stress and Behavioral Patterns in Work Environments through Ubiquitous Sensing,” Submitted to Conf. on Affective Computing & Intelligent Interaction, 2024.¹ (Not Accepted)
- A. C. Timmons, J. B. Duong, K. E. Carta, S. N. Walters, D. I. Benamu, G. A. Jumonville, G. F. Freitag, A. A. Tutul, **A. Cabrera**, J. S. Comer, T. Chaspari, & S. Narayanan, “Psychophysiology sensing via wearables to model family well-being,” Society for Affective Science Annu. Conf., Long Beach, CA, 2023. (Paper Abstract)

INVITED TALKS

- **Cabrera, A.***, Dove, C.*, Del Pesce, V.* (2024). “STEAM Generative AI Ethics Workshop.” Led an introductory workshop on generative AI and AI ethics at the University of Southern California’s Black College Success STEAM Closing Program.
- **Cabrera, A.***, Lopez, A*. (2024). “Bridging Cultures, Building Breakthroughs: AI Ethics.” Led a workshop on the importance of ethics and Latinx representation at the University of California, Riverside’s SHPEtinias conference.
- **Cabrera, A.***, Saldana G.*, Hassan N.*, Umoren E*. (2023). “Incident Post-Mortem Analysis - Auto Resolution.” Selected as one of the top 50 teams from a competitive organization-wide selection to present at Microsoft’s E+D Intern Demo Symposium.
- **Cabrera, A.***, Ojukwu, C.*, Lim, S.*, Deng, J.* (2021). “Understanding the Role of Machine Learning in Music.” Center of Computational Media Intelligence, University of Southern California.

COMMUNITY OUTREACH

USC Viterbi K–12 STEM Center

January 2024 – April 2024

- Designed and led AI workshops for K–12 students from local schools, including interactive sessions on generative AI using Google Colab.
- Co-hosted USC’s booth at the LA Maker Faire, educating families on the fundamentals of unsupervised learning through hands-on demos.

Break Through Tech

April 2023 – March 2024

- Organized outreach events across Southern California to encourage women to explore careers in machine learning and data science through the fellowship.
- Led an interactive workshop at UCR’s SHPEtinias conference on algorithmic bias, discussing how models encode inequality and why Latine representation in AI is important.

Ming Hsieh Institute Research Scholar

April 2023 - May 2024

¹Asterisk * indicates equal contribution.

- Selected as one of five undergraduates to receive departmental recognition for research and community impact.
- Organized events to connect students with research opportunities, including workshops on CV writing, REU applications, and department lab sessions.

PROJECTS

- **Plant Health Monitoring System** (Capstone): Built a microcontroller-based system using sensor input and unsupervised learning to detect early plant stress. [GitHub]
- **FPGA-Based Platform Game Controller** (Final Project): Developed a retro-inspired platformer using Verilog on the Nexys 4 FPGA board. [GitHub]
- **Flick Pick Chrome Extension** (Hackathon): Created a Chrome extension that applies collaborative filtering to generate personalized movie recommendations. [GitHub]
- **Electric Guitar with Band-Reject Filter** (Final Project): Built an electric guitar with a band-reject circuit to amplify signals while filtering out and attenuating high-frequency noise.

AWARDS & HONORS

- **Albert Dorman Future Leader Award**, USC 2024
Awarded to top graduating Viterbi seniors for academic excellence and leadership potential.
- **Grand Challenges Scholar**, National Academy of Engineering 2024
Recognized for interdisciplinary engagement across the five NAE Grand Challenge Mindsets.
- **Honorable Mention**, National Center for Women & IT (\$2,500) 2024
One of twelve undergraduate and graduate women recognized for impactful computing research.
- **Research Scholar**, USC Ming Hsieh Institute (\$1,000) 2023 - 2024
Awarded to five undergraduates in the department for exceptional contributions to research.
- **Finalist**, National Center for Women & IT 2023
Recognized as one of 47 undergraduate and graduate women for computing innovation.
- **College Match Finalist**, Questbridge 2020
National program for high-achieving, low-income students earning full-ride scholarships.

PROFESSIONAL DEVELOPMENT

- Científico Latino Graduate School Mentorship Initiative 2024
- Google Computer Science Research Mentorship Program 2023
- Google LatinX Student Leadership Summit 2022
- America Needs You Fellowship 2021 - 2022

SELECTED SCHOLARSHIPS

- **Presidential Scholar**, USC (\$54,000) 2020 - 2024
USC's highest merit-based scholarship for incoming students.
- **Linn-Viterbi Scholar & Fellow**, USC (\$13,000) 2020 - 2024
Awarded to support academic excellence, research, and leadership in engineering.

SKILLS & INTERESTS

- **Programming Languages:** Python, C++, C#, MATLAB, Verilog, KQL
- **Machine Learning:** Deep Learning, Supervised/Unsupervised Learning, Statistical Analysis
- **Product & Research Skills:** Data Analysis, Problem Scoping, User-Centered Design, Prototyping, Technical Writing, Presenting, Cross-Functional Collaboration
- **Languages:** Spanish (Native Speaker), English (Native Speaker)